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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/838,343

04/20/2001

Yoshihiro Hayashi

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7590

11/19/2003

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EXAMINER

LEE, HSIEN MING

ART UNIT

PAPER NUMBER

2823

DATE MAILED: 11/19/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/838,343

Applicant(s)

HAYASHI ET AL.

Examiner

Hsien-Ming Lee

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2823

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 13 June 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The <sup>Corrected</sup> drawing(s) filed on 13 June 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. §§ 119 and 120**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.  
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_ 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Remarks*

1. The 112-second-paragraph rejection to claim 9 and the indication of allowable subject matter are withdrawn.
2. Claims 1-9 are pending in the application.

### *Claim Rejections - 35 USC § 103*

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brinker et al. (US 6,387,453) in view of Sun et al. (US 6,349,668).

In re claims 1, 5 and 9, Brinker et al. teach the claimed method for vaporization of liquid of organic feedstock (i.e. an interstitial compound) made of an organic oligomer (col. 6, lines 28-30) capable of forming an organic polymer insulation film (i.e. a low dielectric constant film, col. 2, lines 65-67), which comprises:

- mixing the liquid organic feedstock with solvent, surfactant form a mixed fluid (col. 11, claim 1);
- spraying, using spray-coating technique (col. 2, lines 25-29) the mixed fluid on a substrate;
- heating the mixed fluid (col. 11, claim 2); and
- vaporizing (i.e. evaporating) the liquid organic feedstock (col. 11, claim 1).

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Brinker et al. teach further suggest the **desirability** of substituting the spray-coating with aerosol processing in the spraying step (col. 2, lines 21-29).

What Brinker et al. do not expressly teach is that mixing the liquid organic feedstock with a carrier gas at a temperature lower than a heat polymerization reaction starting temperature of the liquid organic feedstock to form a gas-liquid mixed fluid; and spraying the gas-fluid mixed fluid on a vaporization vacuum chamber to form an aerosol, which are **related to** the procedure of aerosol process.

Sun et al, however, teach the aerosol process for forming insulation film (col. 4, lines 20-32), comprising, mixing the liquid organic feedstock (i.e. monomer, col.3, lines 30-32) with a carrier gas (i.e. inert gas, col. 5, lines 60-62) at a temperature lower than a heat polymerization reaction starting temperature of the liquid organic feedstock to form a gas-liquid mixed fluid; and spraying the gas-fluid mixed fluid on a vaporization vacuum chamber to form an aerosol 73A via aerosol generator (col. 5, line 65 through col. 6, line 12; col. 7, line 61 through col. 8, line 6 and Figs. 1-5A).

Therefore, it would have been obvious to one of the ordinary skill in the art, at the time the invention was made, to apply the aerosol process, as taught by Sun et al. in the method of Brinker et al., since by doing so it would uniformly deposit aerosol particles as insulation film on the substrate (abstract, Sun et al.)

In re claims 2 and 6, the selection of the diameter of aerosol particles is obvious because it is a matter of determining optimum process condition by routine experimentation with a limited number of species. In re Jones, 162 USPQ 224 (CCPA 1955)(the selection of optimum ranges within prior art general conditions is obvious) and In re Boesch, 205 USPQ 215 (CCPA

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1980)(discovery of optimum value of result effective variable in a known process is obvious).

For example, Sun et al. teach that the diameter (i.e. particle size) of the aerosol particles is the consideration of maintaining uniform flow distribution (col. 9, lines 52-63 and col. 8, lines 33-67). In such a situation, the applicant must show that the particular range is critical, generally by showing that the claimed range achieves unexpected results relative to the prior art range. See M.P.E.P. 2144.05, III

In re claims 3 and 7, Brinker et al. in view of Sun et al. teach that the liquid organic feedstock is a monomer (col.3, lines 30-32, Sun et al.) but do not teach that the monomer is divinylsioxanebisbenzocyclobutene monomer. However, one of the ordinary skilled in the art would have been motivated to use a desired monomer in the aerosol process to form a desirable insulation film, dependent upon the application of the insulation film, such as a low dielectric constant insulation film.

In re claims 4 and 8, the selection of the operating parameters in the aerosol process (i.e. flow rate of the carrier gas and the liquid organic feedstock and the spraying pressure) is obvious because it is a matter of determining optimum process condition by routine experimentation with a limited number of species. In re Jones, 162 USPQ 224 (CCPA 1955)(the selection of optimum ranges within prior art general conditions is obvious) and In re Boesch, 205 USPQ 215 (CCPA 1980)(discovery of optimum value of result effective variable in a known process is obvious). One of the ordinary skilled in the art would have been motivated to optimize the aforementioned operating parameters in the aerosol process to meet the production requirement (col. 7, lines 6-25, Sun et al.) and to form a uniform insulation film on the substrate (abstract, Sun et al.).

*Conclusion*

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

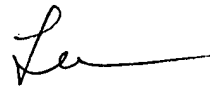
Sugahara et al. to US 5,989,998 also teach the related invention (col. 8, lines 3-16 and cols. 9-10).

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hsien-Ming Lee whose telephone number is 703-305-7341. The examiner can normally be reached on M-F (9:00 ~ 5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri can be reached on 703-306-2794. The fax phone number for the organization where this application or proceeding is assigned is 703-308-7382.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

Hsien-Ming Lee  
Examiner  
Art Unit 2823



Nov. 13, 2003